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SCIENCE & TECHNOLOGY

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IMPROVEMENT OF SEED ENCRUSTATION

18400013a Moscow ZASHCHITA RASTENIY in Russian No 8, Aug 87 pp 26-27

[Article by T.B. Prokhorova]

[Abstract] Seed treatment using film-forming substances (encrustation) is widely used at farms and corn-treatment plants. A seminar was held on the development of seed encrustation products at the Exhibition of Achievements of the Economy of the USSR, with particular attention given to characteristic errors which result in reduction in quality of seed treatment. To date, however, a special agricultural grade of sodium carboxymethylcellulose, the most suitable film-forming agent, has not been developed. This product can be dissolved in cold water, but the use of warm water is recommended to produce better encrustation properties. It is most convenient to use prepared products in the form of concentrated pastes which are now under development. Scientists are also working on the creation of preparations with growth-regulating additives synthesized at the Institute of Chemical Physics, USSR Academy of Sciences. There is interest in film-forming seed treatments in the form of wetting powders, including sodium carboxymethylcellulose as a film-forming agent.

6508/12223

INDUCED IMMUNITY IN PLANTS

18400013b Moscow ZASHCHITA RASTENIY in Russian No 8, Aug 87 pp 28-29

[Article by Yu.T. Dyakov, professor, Moscow State University]

[Abstract] Studies in th area of induced immunity in plants e proceeding in several directions, including vaccination, treatment of plants with metabolites of phytopathogenic fungi, inducing defensive reactions, and treatment of plants with chemical substances regulating defensive reactions. Acting directly on the host, several factors can be used: Inhibition of penetration of fungus structures into the plant tissue; increasing the resistance of cell walls to attack by pectolytic enzymes; activation of phenol metabolism and oxidative enzymes; induction of the synthesis of antifungal substances in plants; sensitization of plants, such that defensive reactions are evoked in response to infection; and reduction in the duration of the phase of ontogenesis susceptible to disease. Inductors can also act on the parasites, inhibiting their attachment to the surfaces of plants, inhibiting the process of penetration of plant cells and inhibiting the degradation of the cuticle of the plants.

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UDC 577.112.5:595.44-114.5.088

TOXIC COMPONENTS OF VENOM OF CELLAR SPIDER SEGESTRIA FLORENTINA

18400001a Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 13, No 8, Aug 87 (manuscript received 28 Jul 86; after revision 28 Nov 86) pp 1013-1018

[Article by N.Zh. Sagdiyev, L.A. Valiyeva, A.S. Korneyev, A.A. Sadykov and Sh.I. Salikhov, Institute of Bioorganic Chemistry, Uzbek SSR Academy of Sciences, Tashkent]

[Abstract] Gel filtration on a precalibrated column with sephadex G-100 was used to estimate the molecular weight of the active components in Segestria Florentina venom. The effect of the venom, prolongation of the action potential by retarding inactivation of the sodium channel, was found to be produced by the components with MW less than 10,000 Da. Two neurotoxins and an insectotoxin were isolated, their homogeneity proven by disk electrophoresis, isoelectric focusing and analysis of N-terminal amino acid groups. The neurotoxins were found to be polypetides, MW about 5,000 Da. The insectotoxin contained 35 amino acid groups. The full primary structure was established for this substance, with MW 3,988 Da. The first neurotoxin, Sf-1, had MW 3,500 Da, while Sf-2 had MW 5,100 Da. Figures 5; references 21: 7 Russian, 14 Western.

6508/12223

UDC 579.841.93.083.3:577.113.5

MOLECULAR NATURE OF POLYSACCHARIDE BRUCELLA (POLY-B) ANTIGEN

18400001b Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 13, No 8, Aug 87 (manuscript received 20 Mar 87) pp 1070-1074

[Article by V.L. Lvov, G.N. Pluzhsnikova, Ye.B. Lapina, A.S. Shashkov, S.A. Askerova, V.Ye. Malikov, Ye.A. Dranovskaya and B.A. Dmitriev, Institute of Epidemiology and Microbiology, imeni N.F. Gamaleya, USSR Academy of Medical Sciences, Moscow; Institue of Organic Chemistry, imeni N.D. Selinskiy, USSR Academy of Sciences, Moscow]

[Abstract] A systematic chemical study was performed of the brucella antigens. A previous report established the structure of the O-specific polysaccharide chains in Brucella melitensis 565 and B. abortus 19-BA. This article presents data on the chemical structure of the polysaccharide poly-B-antigen, recently used in diagnosis of brucellosis in animals. The poly-B-antigen was isolated by autoclaving cells of the virulent strain B. Melitensis 16M in water with subsequent multistage precipitation with alcohol. Repeated chromatography of the fractions produced revealed that the poly-B-antigen is not an individual polymer, but a complex including both high-molecular-weight fractions and an unknown polysaccharide with a low-molecular-weight fraction. Two carbon-containing components were found--an O-specific lipopolysaccharide and a nonimmunogenic cylical (1- 2)- -D-glucane. These components can form an antigen complex which has been called poly-B. Figures 2; references 8: 1 Russian, 7 Western.

6508/12223

UDC 547.572.3.052

ARYL-CONTAINING ALL-TRANS-AND 13-CIS-RETINAL ANALOGS AND THEIR NONCOVALENT COMPLEXES WITH BACTERIOOPSIN

18400001c Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 13, No 8, Aug 87 (manuscript received 6 Nov 86) pp 1116-1124

[Article by S.V. Yeremin, B.I. Mitsner, Ye.N. Zvonkova and R.P. Yevstigneyeva, Moscow Institute of Precision Chemical Technology, imeni M.V. Lomonosov]

[Abstract] The functioning of bacteriorhodopsin as a light-dependent proton translocase involves 13-trans $\Longleftrightarrow$ 13-cis-isomerization of retinal, which is confirmed by the use of polyene aldehydes--structural analogs of retinal, for which this isomerization is impossible. Only three analogs diagrammed in this article can form artificial chromoproteins with bacterioopsin. The authors synthesized these retinal analogs, in which conjugation between the aldehyde group and polyene chain is performed through a benzene ring. The mutual placement of these substituents is represented as p-, m- and o-substitution. The study demonstrates the promise of using, the synthesis of aryl-containing retinoids, the reaction of ethynylation of aromatic iodides, catalyzed by palladium complexes, as well as the use of 9-(2-propinlyl-β-ionol as the C_{16} fragment. The interaction of the three analogs leads to the formation of noncovalent complexes. It is quite probable that the great reduction in basicity determined in model aldimenes is also correct for interaction of the corresponding aldehydes with natural bacterioopsin, leading to a shift in the equilibrium in the reaction of formation of aldimenes in the direction of natural compounds (aromatic aldehydes and bacterioopsin). Figures 3; references 18: 9 Russian, 9 Western.

6508/12223

UDC 577.37

TEMPERATURE VARIATION OF RAPID NEGATIVE PHASE IN BACTERIORHODOPSIN CYCLE

18400003a Moscow BIOFIZIKA in Russian, Vol 32, No 4, Jul-Aug 87 (manuscript received 13 Jan 86) pp 601-605

[Article by S.K. Chamorovskiy, A.A. Kononenko, A.B. Rubin and D.S. Chernavskiy, faculty, Moscow State University imeni M.V. Lomonosov; Physics Institute, imeni P.N. Lebedev USSR Academy of Sciences]

[Abstract] In spite of the many works on bacteriorhodopsin, the mechanism of the primary stages of energy transformation remains unknown. A study of the temperature variation of photoelectrogenesis kinetics in purple membranes can facilitate a deeper understanding of the nature of these primary photo processes. Such a a study is reported in this article. The negative phase remains rapid at temperatures down to -160°C, with little change in amplitude. This phase of generation of membrane potential involves the movement of an electron over a distance of about 10 A along the retina. The analysis speaks in favor of the hypothesis of electron-tunnel transformation of energy in bacteriorhodopsin. Data from previous studies indicate that in the earliest stages of the bacteriorhodopsin photo cycle, an isomer trans-cis transition of a retinal chromophore group occurs. Since the retinal molecule has great dipole moment, this transition may contribute to the photo potential recorded. However, the mechanism by which the movement of a comparatively large molecular fragment moves by over 5-10 A in less than 300 nsec in a condensed medium of low temperatures is not clear. Theoretical analysis of the specific models of molecular dynamics in the chromophore-protein complex of bacteriorhodopsin is required. Figure 1; references 23: 9 Russian, 14 Western.

6508/12223

EFFECT OF MELITIN ON HEART CELL MEMBRANE IONIC CURRENTS

18400003b Moscow BIOFIZIKA in Russian, Vol 32, No 4, Jul-Aug 87 (manuscript received 24 Jan 86) pp 620-623

[Article by A.K. Filippov, G.Ye. Skatova, V.I. Porotikov, B.N. Orlov and N.N. Asafova, Scientific Research Institute of Biological Testing of Chemical Compounds, Kupavna (Moscow Oblast)]

[Abstract] A study is reported of the influence of melitin on the action potential and ionic currents of heart-fiber membranes with and without inhibiting phospholipase A_2, as well as the activation and desensitization of β-adrenoreceptors. The experiment showed that melitin at less than 10^{-7} M was ineffective, at greater than 2.10^{-6} M it was toxic, causing rapid, strong depolarization of the membranes and full irreversible suppression of all electrophysiological characteristics. In the intermediate range, melitin depolarized the membrane by 5-15 mV, decreasing the amplitude and duration of action potentials by a factor of 1.5-2 for 3-5 minutes. Melitin influenced neither activation nor desensitization of β-adrenoreceptors, evoked by the β-adrenoagonist novodrin. The results presented indicate that melitin in the intermediate range clearly influences ionic currents and the contraction of cardiac fibers, suppressing I_{Ca}, I_{Na}, increasing the instantaneous I_K in the area of delayed straightening, suppressing both components of cardiac fiber contraction, the phasic more than the tonic. Melitin apparently directly effects the membrane, particularly its protein components, the ionic channels. This effect is apparently not mediated by activation of endogenous phospholipase A_2. Melitin does not influence activation of the adenylate cyclase system and desensitization of the β-adrenoreceptors of the heart cell membranes. Figures 4; references 17: 4 Russian, 13 Western.

6508/12223

STUDY OF INTERACTION OF ORGANOPHOSPHORUS INSECTICIDE GA-41 WITH MODEL MEMBRANES BY NMR-SPECTROSCOPY

18400003c Moscow BIOFIZIKA in Russian, Vol 32, No 4, Jul-Aug 87 (manuscript received 2 Jun 86) pp 679-681

[Article by I.I. Abdrashitova, T.F. Aripov, F.G. Kamayev, F.A. Salakhutdinov, A.A. Abduvakhabov and V.B. Dolgo-Saburov, Institute of Bioorganic Chemistry, Uzbek SSR Academy of Sciences, Tashkent]

[Abstract] NMR-spectroscopy was used to study the interaction of the organophosphorus insecticide GA-41 (O-isopropyl-S-n-butyl-methylthiophosphonate) with lecithin liposomes and multilamellar dispersions of a mixture of lecithin and cardiolipin. The spectra indicate absence of significant changes in the GA-41 molecule signal upon introduction to the carbon chains of the phospholipid, leading to an increase in permeability of the liposomes for Pr^{3+} ions. Figures 2; references 4: 3 Russian, 1 Western.

6508/12223

DISTRIBUTION OF CONDUCTIVITY AMPLITUDES OF TOXIN-INDUCED ION CHANNELS IN LIPID LAYER

18400003d Moscow BIOFIZIKA in Russian, Vol 32, No 4, Jul-Aug 87 (manuscript received 21 Apr 86) pp 681-683

[Article by O.V. Krasilnikov, R.Z. Sabirov, V.I. Ternovskiy, R.K. Zaripova and P.G. Merzlyak, Institute of Physiology, Uzbek SSR Academy of Sciences, Tashkent]

[Abstract] A study was made of the phenomenon of current jumps in ion channels in order to define the nature of forces determining the appearance of channels of various amplitudes. The distribution of conductivity amplitudes in staphylotoxin and latrotoxin channels was found to be independent of the state of the channel-former molecules in aqueous solution, in spite of the fact that the conditions of the medium had a significant influence on conformation and degree of aggregation of staphylotoxin and latrotoxin. Figures 3; references 10: 7 Russian, 3 Western.

6508/12223

UDC 616.36-002-022:578.891-02:615.381-084

HEPATITIS B PREVENTION

18400011 Moscow GEMATOLOGIYA I TRANSFUZIOLOGIYA in Russian Vol 32, No 9, Sep 87 (manuscript received 29 Sep 86) pp 46-48

[Article by A.F. Frolov, M.Ya. Orgel, T.Yu. Melnichenko, L.T. Martsinkovskiy, V.G. Yakushev, L.F. Shevchenko, V.A. Kirilenko, L.M. Stratiyenko, V.P. Shilov and N.V. Tychinskiy, Scientific Research Institute of Epidemiology and Infectious Diseases imeni L.V. Gromashevskiy, UkSSR Ministry of Health, Kiev]

[Abstract] In 1981 the Vinnitsa Oblast began screening donated blood for HBsAg antigens at all central hospitals. Fatients of various Oblast medical institutions who were HBsAg carriers were also identified. Counter-flow immunoelectrophoresis was used for blood testing. The frequency of HBsAg carriers observed among patients correlated with the frequency of transfusions employed by their medical department. Phthisiatric patients had the most transfusions and and carriers, followed by hematologic and surgical patients. Gynecological and therapeutic departments had few transfusions or carriers, but the level of carriers exceeded that in the blood donor population by a factor of five. Blood screening decreased the number of carriers among tubercular patients by a factor of eight and among hematological patients by a factor of fifteen. Hepatitis morbidity among blood recipients decreased by a factor of two in the entire Oblast from the start of screening to 1984. While other routes of transmission of hepatitis, including A, B and not A not B, remain, the results indicate that screening of donated blood is an effective measure for reducing posttransfusion hepatitis morbidity. Figures 2; references 9 (Russian).

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MODELING PROTECTIVE EPITOPES OF VP_1 PROTEIN OF FOOT AND MOUTH DISEASE VIRUS TYPE O AND A WITH SYNTHETIC PEPTIDES

18400002 Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 13, No 8, Aug 87 (manuscript received 24 Feb 87), pp 1132-1135

[Article by A.Yu. Surovoy, O.M. Volpina, V.T. Ivanov, Institute of Bioorganic Chemistry, imeni M.M. Shemyakin, USSR Academy of Sciences, Moscow, A.V. Chepurkin, V.N. Ivanyushchenkov, A.N. Burdov and N.N. Dryagalin, All-Union Scientific Research Foot and Mouth Institute, Vladimir]

[Abstract] One means of improving the effectiveness of antiviral vaccines may be directed synthesis of the antigen regions of the viral surface protein. The foot and mouth disease virus is an excellent model for testing of this approach. This article reports on synthesis of peptides modeling the basic antigen regions of the O and A serotypes of foot and mouth disease virus encountered in the USSR. Two sets of sequences of peptides were found to afford 50-100% protection in vivo and in vitro, both in the free state and when conjugated with hemocyanin. Region 136-145 is considered an essential part of the major sequential epitope required for antiviral immune response. Segment 136-152 is the smallest peptide capable of eliciting virus-neutralizing antibodies without conjugation with a high-molecular-weight carrier. References 7: 1 Russian, 6 Western.

6508/12223

UDC 615.849.19.015.44:617.713

CORNEAL EFFECTS OF PULSED LASER ENERGIES WITH 1.96 MCM WAVELENGTH

81442141 Moscow VESTNIK OFTALMOLOGII in Russian Vol 13, No 3, 1987
(manuscript received 20 Jul 86) pp 48-51

[Article by P.S. Avdeyev, B.M. Antipenko, candidate of physicomathematical sciences, Yu.D. Berezin, candidate of biological sciences, V.V. Volkov, professor, A.F. Gatsu and O.B. Raba, Chair of Ophthalmology, Military Medical Academy imeni S.M. Kirov, Leningrad]

[Text] Spectral studies on the refractive media of the eye suggest that corneal photocoagulation may be best achieved with IR radiation, i.e., the 1.4 to 3 mcm bandwidth [1]. In this spectral region the corneal coefficient of absorption (K, cm^{-1}) ranges from a fraction to ca. 10^2 cm^{-1}, depending on the wavelength. At the wavelength of interest in the present study, K has an approximate value of 70 cm^{-1} [2].

the present work was designed to provide experimental substantiation for the treatment of surface diseases of the cornea with the 1.96 mcm IR wavelength, using 2 x 10^{-3} sec pulses.

MATERIALS AND METHODS

The studies were conducted on 17 chinchilla rabbits (2.4-3 kg), involving 34 eyes. The apparatus depicted in Fig. 1 was used for corneal irradiation. The

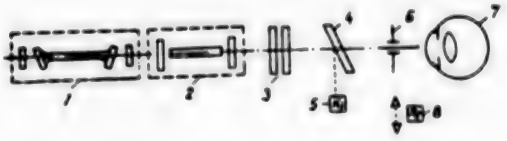


Figure 1. Optical scheme used for studying the biological effects of laser irradiation of the cornea, using a 1.96 mcm wavelength beam and 2 x 10^{-3} sec pulses.

Key:
1. Helium-neon laser
2. $BaYb_2F_2:Er^{3+}$ (8%) laser
3. Interchangeable filters
4. Planiparallel plate
5 and 8. Calorimeters
6. 2 mm-Diameter diaphragm
7. Eye of experimental animal

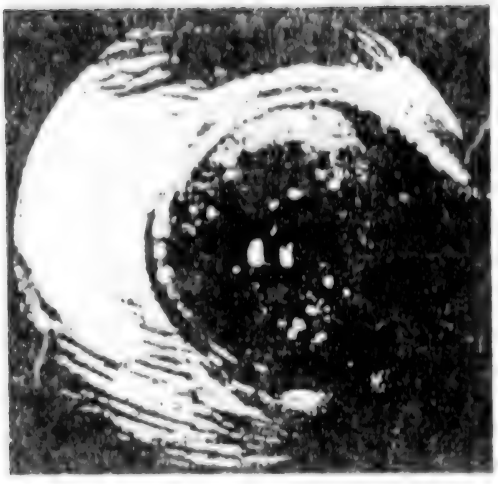


Figure 2. Rabbit eye 1 day after laser irradiation (1.06 mcm wavelength, 2×10^{-3} sec exposure, H = [illegible] J/cm^2).

epithelium was slightly edematous. At certain sites the epithelium separated from the underlying stroma and two-layered pigment areas of normal epithelium, while fimbria-like projections appeared at the de-epithelialized edges of the coagulation lesion.

Maximum H led to the immediate appearance of light injection of the pericorneal vessels and blepharospasm. After 1 day the irritation became more pronounced; the stained area of the ant rior epithelium contracted. Complete epithelialization was observed after [illegible] days.

Symptoms of slight irritation of the eye lasted in all animals after 2-3 days. There were no cases of [illegible] or diminished transparency of the lens.

Examining with the [illegible] day after exposure, corneal opacity along the pathway of the beam determined the boundaries of the photocoagulation region became less distinct and, within 21-30 days, the anterior layers of the corneal stroma caused the formation of slight, [illegible] opacity.

Histological studies within 10 min of exposure showed that with maximum H the thickness of the affected epithelial cover decreased (Fig. 3); at some sites

Figure 3. Rabbit cornea 1 h after laser irradiation (1.06 mcm wavelength, 2×10^{-3} sec exposure, H = [illegible] J/cm^2.) Hematoxylin/eosin. X30.

the anterior epithelium disappeared completely. Boundaries between adjacent epilethial cells were indistinguishable, and their distribution was disordered. The nuclei were reduced in size; at certain places the anterior epithelium was completely separated from Bowman's capsule. Within the corneal coagulum slit-like microcavities were apparent. There were no histologic changes in the posterior stromal layers, Descemet's membrane, or the posterior epithelium.

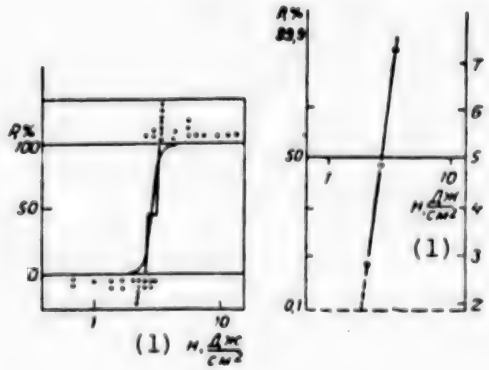
In addition, photocoagulation resulted in a 10-15% increase in the thickness of the cornea due to formation of the stromal microcavities.

Morphologic studies conducted 7 days after photocoagulation demonstrated complete epithelialization. The epithelial component consisted of 5-6 layers of cells that were identical to those seen in control corneas. The cellular elements in the affected regions of the stroma also showed complete normalization and disappearance of the microcavities. The posterior layers of the stroma, Descemet's membrane, and the posterior epithelium that were in the pathway of the laser beam retained their normal structures.

Biomicroscopy of the rabbit eye one year after photocoagulation (H = 12 J/cm^2) showed virtually complete disappearance of the cloudiness noted immediately after the photocoagulation.

Determinations of MPL were based on threshold changes in the cornea representing minimal changes detectable by biomicroscopy. The threshold effect was assessed in terms of 'yes' or 'no' criteria.

The experimental points for corneal threshold lesions were used to construct histograms and regression plots (Fig. 4), relying on probit analysis and comple-



Figures 4. Plots of probability of corneal threshold lesions (P) in relation to the energy of exposure (H) of the 1.96 mcm beam and 2 x 10^{-3} sec pulses. a -- Histogram. b -- Regression line for the effect on log probit paper.

Key: 1. H, J/cm^2

mented by the method of least squares [2]. The energy of the exposure corresponding to a 50% probability of a threshold lesion (H_{50}) with a 95% confidence interval was determined graphically. H_{50} was found equal to 2.9 $\pm$ 0.5 J/cm^2.

In analogy to the methods employed in pharmacology [3], the line of regression was used to determine the H value inducing a threshold lesion with a probability of 0.1% ($H_{0.1}$), which was taken as the 'null level.' In the present case $H_{0.1}$ was calculated as 2.1 J/cm^2.

Taking into consideration the identical histological and optical characteristics of rabbit and human corneal membranes, it was assumed that the 'null level' established for the rabbit applies to humans.

The elementary nature of the processes occurring in the cornea as a result of absorbing the energy provided by a 1.96 mcm laser beam suggested that the statistical scatter of the experimental data due to individual variation is small. Consequently, accepting a safety factor of 10 used in industrial medicine [4], the MPL for the human eye was calculated as $H_{MPL} = 0.2$ J/cm^2. This fact indicates that 1.96 mcm wavelength laser pulses 2×10^{-3} sec in duration are more dangerous than equivalent pulses from a 1.54 mcm wavelength laser beam. For the latter $H_{MPL} = 0.6$ J/cm^2 [2].

CONCLUSIONS

1. IR lasers operating with 1.96 mcm emission and 2×10^{-3} sec pulse duration elicit superficial photocoagulation of the corneal membrane. The depth of penetration depends on the energy of the beam: with energies ranging from 3.3 to 12 J/cm^2 photocoagulation may range from the epithelium to a depth encompassing 2/3rd of the stroma.

2. The MPL ($H_{MPL} = 0.2$ J/cm^2) established for this laser modality vis-a-vis the human eye may be of use in establishing safety standards.

3. Lasers emitting at 1.96 mcm may be recommended for clinical photocoagulation in the management of superficial keratitis. High energy can be concentrated at the target site without danger of damage to posterior corneal layers or deeper eye structures.

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CSO: 81442141

UDC 557.4.620.197

ECOLOGICAL GROUPS AND CHARACTERISTICS OF FUNGI WHICH DAMAGE INDUSTRIAL MATERIALS

18400010 Moscow BIOLOGICHESKIYE NAUKI in Russian No 8, Aug 87 (manuscript received 12 Nov 85) pp 81-87

[Article by I.V. Zlochevskaya, Department of Lower Plants, Moscow State University imeni M.V. Lomonsov]

[Abstract] The position of biodestructive fungi in the ecosystem is reviewed. Sixty-seven species are listed, with ability to grow on paper, books, oil, fuel, paintings, frescos, dyes, lacquers, plastics, electrical cable, covered metals, lenses, optics, ores, stones, concrete and compound materials of mineral origin noted. Aspergillus, Penicillium, Trichoderma, Alternaria and Fusarium species are relatively nonspecific saprophytes, while Serpula lacrymans and Cladosporium resinae have evolved in response to specific substrates. The succession of mold species on various materials has only been studied for a few materials, notably blood. Succession is influenced by factors such as humidity, temperature, geographical location and population density in the surrounding environment. The majority of fungal species which damage industrial materials are characterized by high multiplicative energy. The ability of many molds to form long mycelia results in damage to materials which the fungi can not metabolize. The formation of a wide variety of enzymes and toxins permits fungi to survive on the widest range of substrates. Organic acid products cause the most substrate damage. The ability of fungi to survive extreme environmental conditions, to grow on dry solids by using atmospheric water and to utilize low nutrient concentrations contributes to their destructive power. Species heterogenicity, mutability and heterocaryotypicity contribute to adaptability. This review points out the dominent role which fungi play in the biodestruction of natural and man-made materials. References 21: 17 Russian, 4 Western.

12126/12223

UDC 617-001-036.17-06:617-002.3-037

PROGNOSIS OF INFECTIOUS COMPLICATIONS IN SEVERE TRAUMA

18400012 Moscow ORTOPEDIYA, TRAVMATOLOGIYA I PROTEZIROVANIYE in Russian No 7, Jul 87 (manuscript received 20 Aug 86) pp 4-8

[Article by I.G. Leshchenko, B.N. Sofronov and I.I. Dochkin, Department of Military Field Surgery, Military Medicine Faculty, Kuybyshev Medical Institute; Department of Immunology, Institute of Experimental Medicine, Leningrad]

[Abstract] In order to predict infectious complications, blood serum lysozyme levels, Kawetzky and Rotter intradermal tests, C-reactive protein, sialic acid and fibrinogen levels were studied in 188 patients with severe trauma and 42 normal controls. Multiparameter mathematical analysis was used to evaluate patient reactivity and degree of traumatic inflammation of the injury. Patients with satisfactory reactivity and weakly-expressed traumatic inflammation were classified as low-risk. Patients with low reactivity and marked traumatic inflammation were considered high-risk. When only one aspect was unfavorable, the patient status was classified as unclear. Low-risk patients received anti-shock therapy, surgical treatment of wounds and prophylactic doses of antibiotics. High-risk patients also received anabolic hormones, purine and pyrimidine preparations, vitamin complexes and transfusions and freshly-citrated blood. Patients of unclear status were reevaluated after 5-7 days. Complications developed in 86.1% of the high-risk patients and 15.4% of the low-risk. Low-risk patients comprised 37.2% of the total group studied. Those low-risk patients who developed complications exhibited decreased reactivity and increased inflammatory processes on reevaluation. In the twelve patients whose original status was unclear, seven developed complications, with their risk indicators rising after 5-7 days. The results indicate the usefulness of the approach described for predicting posttraumatic infectious complications. References 13: 11 Russian, 2 Western.

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UDC 615.214.31.015.4:612.824-06:612.014.47

EFFECT OF CAFFEINE AND SYDNOPHENE ON BLOOD SUPPLY TO BRAIN, KIDNEY AND HIND LIMBS UNDER CONDITIONS OF ANTIORTHOSTASIS

18400004a Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 50, No 3, May-Jun 87 (manuscript received 13 Feb 86) pp 39-42

[Article by Ye.I. Konyayeva and A.I. Beketov, Chair of Pharmacology, Pediatric Faculty with a Course of Clinical Pharmacology (Director: Professor A.I. Beketov), Crimean Medical Institute, Simferopol]

[Abstract] Changes in the blood flow in brain, kidneys and vena cava caudalis of animals (cats) under prolonged antiorthostasis were studied using caffeine and sidnophene as protective agents. During prolonged antiorthostasis, redistribution of the animals' blood mass occurs in the direction of cranium, resulting in increased brain and kidney blood flow (BF) and a dual phase BF change in the vena cava caudalis. Sydnophene leads to an increased hypertensive reaction and higher brain and kidney BF; caffeine shortens the phase of increased BF in the vena cava caudalis. Prophylactic administration of sydnophene had no significant influence on brain BF but lowered kidney BF. Caffeine used prophylactically diminished the phase of increased BF in all organs studied; arterial pressure was also decreased. References 11: (Russian).

7813/12223

UDC 616.859.1-085.217.34-039.71+615.217.34.03:616.859.1-084

MEDICAL PROPHYLAXIS OF SEA SICKNESS SYNDROME (MOTION SICKNESS)

18400004b Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 50, No 3, May-Jun 87 (manuscript reviewed 11 Oct 86) pp 5-20

[Article by V.S. Shashkov, V.V. Sabayev, S.L. Ilina and R.R. Galle, Institute of Medical Biological Problems, USSR Ministry of Health, Moscow]

[Abstract] Sea sickness syndrome (SS) represents a variety of motion diseases which may be manifested openly or in an occult form. Both may cause accidents during performance of various duties related to control of transportation equipment (ships, planes or space vehicles). A review is presented of the literature covering the etiology, pathogenesis and mechanism of development of SS. Six classes of anti-motion sickness drugs are discussed covering their advantages and side effects: cholinolytics, adrenomimetics, antihistamines, CNS depressing agents, other pharmacological preparations (vitamins, antinausea drugs) and their combinations. The success in developing effective drugs will depend on a rational approach including modelling and not on empirical screening of a large number of drugs. References 132: 45 Russian, 87 Western.

7813/12223

UDC 616.89-008.441.13-036.87-085.21:546.34]-039.71

EXPERIMENTAL JUSTIFICATION FOR USE OF LITHIUM HYDROXYBUTYRATE IN PHARMACO-PROPHYLAXIS OF RELAPSES OF ALCOHOLISM

18400004c Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 50, No 3, May-Jun 87 (manuscript received 26 Nov 85) pp 71-74

[Article by B.I. Lyubimov and A.N. Yavorskiy, Laboratory of Medical Toxicology, Institute of Pharmacology, USSR Academy of Medical Sciences, Moscow]

[Abstract] Experimental results are presented which support the use of lithium hydroxybutyrate (LiHB) as a pharmaco-prophylactic agent for treating relapses of alcoholism. Administration of LiHB lowered, significantly, experimental animals' preference for alcohol. This appeared to be a specific response to LiHB because it could be totally reversed by withdrawing the agent and again reversed by readministering it. In animals exposed to long-term alcohol intake, LiHB improved their CNS conditioned reflex activity and stimulated their defense-adaptive mechanisms. During forced consumption of alcohol LiHB slowed down the addiction process. Thus, it is recommended as a prophylactic agent for control of alcoholism relapses. Figures 3: references: 7 Russian.

7813/12223

UDC 615.214.32.015.4:612.592-064

DURATION OF ANTIHYPOTHERMIC EFFECT OF ANTIDEPRESSANT PHTHORACYZINE DURING GALANTAMINE-INDUCED HYPOTHERMIA

18400004d Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 50, No 3, May-Jun 87 (manuscript received 17 Sep 85) pp 102-103

[Article by O.I. Smirnova and V.P. Fedonyuk, Military Medical Academy imeni S.M. Kirov, Leningrad]

[Abstract] Ability of phthoracyzine to prevent a galantamine-induced hypothermic effect was compared with that of amizyle. Experiments were performed on white rats during winter months. It was shown that phthoracyzine at doses of 30, 40, 80 and 120 mg/kg prevented a drop in rectal temperature when administered 1, 3, 5 and 24 hrs prior to SC injection of galantamine (10 mk/kg, representing 1/4 LD_{50}). When the dosage was raised to 80 and 120 mg/kg, the anti-hypothermic effect was evident even after 48 hrs post-administration. Amizyle exhibited an incomplete and transient, dose-independent, antagonistic effect towards galantamine. References 7: 2 Russian, 5 Western.

7813/12223

UDC 615.277.3.076.7

POTENTIAL USE OF COBALAMINES IN TRANSPORT OF CYTOSTATIC AGENTS

18400005a Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 21, No 3, Mar 87 (manuscript received 29 Jan 86) pp 287-289

[Article by T.L. Korsova, A.A. Poznanskaya, Ye.V. Belozerova, I.P. Rudakova and A.M. Yurkevich, Scientific Production Association "Vitaminy", Moscow]

[Abstract] It was shown to be possible to use cobalamines as a transport system for delivering cytostatic agents to E. coli 113/3 cells followed by liberation of cytostatic groups in these cells due to metabolism of cobalamines. At low concentration, these compounds promoted cell growth while inhibiting it at 10^{-7} M and higher concentrations. The following compounds were studied: [5-fluoro-(uracyl-1-yl)methoxyethyl]cobalamine (I), (5'-desoxy-1-β-D-arabino=cytosyl)cobalamine (II), [5'-desoxy-(6-mercapto)purineribosyl]cobalamine (III), [6-mercapto-(purin-9-yl)methoxyethyl]cobalamine (IV) and [(guan-9-yl)-methoxyethyl]cobalamine (V(). Only compounds (I) and (IV) exhibited cytotoxic activity. The other compounds were evidently incapable of liberating adequate levels of β-ligands. Figures 31; references 12: 3 Russian, 9 Western.

7813/12223

UDC 615.21/22:547.831.9].012.1

NITROGEN-CONTAINING SILICONORGANIC COMPOUNDS. PART 127. SYNTHESIS AND PHARMACOLOGICAL STUDY OF DIIODOMETHYLATES OF METHYL (TRIALKYLSILYLPROPYL)-AMINOETHYL ESTERS OF 2- AND 4-QUINOLINE CARBOXYLIC ACIDS

18400005b Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 21, No 3, Mar 87 (manuscript received 6 Sep 85) pp 304-308

[Article by E. Lukevits, T.V. Lapina, S.K. Germane, R.D. Vitolinya and M.M. Veveris, Institute of Organic Synthesis, LaSSR Academy of Sciences, Riga]

[Abstract] Diiodomethylates of methyl (trialkylsilylpropyl)aminoethyl esters of quinaldinic acid and cinchoninic acid were synthesized by reacting trialkyl-[3-(N-methyl- N-2-hydroxyethylamino)propyl]silanes with corresponding acid chlorides in presence of Et_3N in dry ether. These compounds exhibited neurotropic activity of the deprimatory type which increased with increasing size of the alkyl groups at the silicon atom: $Me_3 < MeEt_2 < Et_3 < mePro_2$. Toxicity of these compounds increased in an analogous fashion. Quinaldinic derivatives showed higher activity than the cinchoninic compounds; they also reduced arterial pressure, exhibited antifibrillating activity and affected para-sympathetic ganglia of the heart. None of the compounds studied showed any analgesic effect, α- and β-adrenoblocking activity or antihistamine activity. References 6: 5 Russian, 1 Western.

7813/12223

UDC 615.277.3:547.861.3].012.1

SYNTHESIS AND BIOLOGICAL ACTIVITY OF DISPYROTRIPIPERAZINIUM DERIVATIVES

18400005c Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian
Vol 21, No 3, Mar 87 (manuscript received 13 Aug 85)
pp 319-321

[Article by G.A. Chernov, N.I. Lisina, N.M. Karimova, O.V. Kildisheva and I.L. Knunyants, Institute of Biophysics, USSR Ministry of Health; Institute of Scientific Experimental Organ Synthesis, USSR Academy of Sciences]

[Abstract] A number of potential radioprotectors was synthesized on the basis of dispyrotripiperazinimum (DSTP), which facilitates penetration of substances through the hematoencephalic barrier: N,N"'-di-[β-(thiosulfate) propionhyl]-N'-N"-DSTP; N,N"'-di-[β-thiosulfate)ethyl]-N',N"-DSTP; N,N"'-di-[β-(acetylthio)-propionyl]-N',N"-DSTP dibromide; N,N"'-di-[β-(acetylthio)-ethyl]-N',N"-DSTF dichoiide; N,N"'-d-[β-(isothiuronium)-propionyl]-N',N"-DSTP dichloride dibromide and N,N"'-di-[o,o-dimethylthiophpsphate)]-N',N"'-DSTP dichloride. These compounds showed no radio-protective activity. Their toxicity (ranging from 16 to 1,000 mg/kg) was related to the liberation rate of mercaptogroups. References 10: (Russian).

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UDC 615.849.1.015.25:547.496.3].012.1

SYNTHESIS AND INVESTIGATION OF RADIOPROTECTIVE PROPERTIES OF SOME N-ALLYL-N'-SUBSTITUTED THIOCARBAMIDE DERIVATIVES

18400005d Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian
Vol 21, No 3, Mar 87 (manuscript received 24 Sep 85)
pp 322-328

[Article by L.I.Mizrakh, L.Yu. Polonskaya, A.N. Gvozdetskiy, A.M. Vasilyev, T.M. Ivanova and N.I. Lisina, Institute of Biophysics, USSR Ministry of Health]

[Abstract] A series of N'-substituted derivatives of N-allylthiocarbamide was synthesized along with linear and cyclic isothiuronium derivatives containing one or more thiocarbamide fragments--in the study of structure-activity relationship of these potential radioprotectors. Spectral properties and physical-chemical properties of all compounds are reported. All of these thiocarbamide derivatives showed greater toxicity than the parent compounds. This toxicity intensified with increased number of thiazolidine rings in a molecule. None of these compounds showed any radioprotective activity. References 10: 8 Russian (2 by Western authors), 2 Western.

7813/12223

UDC 615.014.6:615.451.234:577.352.2].012

SYNTHESIS OF LIPOSOMES WITH MEDICAL PREPARATIONS

18400005e Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 21, No 3, Mar 87 (manuscript received 24 Feb 86) pp 347-352

[Article by V.G. Budker, T.Ye. Vakhrusheva, Ye.V. Kiseleva and N.B. Khristolyubova, Institute of Bioorganic Chemistry; Institute of Cytology and Genetics, Siberian Department USSR Academy of Sciences]

[Abstract] A simple procedure is described for preparation of liposomes just before their medicinal application, making it possible to include highly effective drugs: lipid is dispersed by any of the common methods in a solution containing 0.15 M mannite or glucose which may, but does not have to, contain the drug to be encapsulated. The suspension is sterilized with UV light, it is then lyophilized and hermetically sealed under argon atmosphere. Just before the use, water or the drug is added to the lyophilized material to make a 0.15 M concentration of mannite or glucose and 100 mg/ml lipid concentration. The suspension is frozen 5 times and thawed, finally it is diluted with physiological solution to the desired concentration. This leads to a 75.5 to 98.8% capture of the drugs by liposomes. Figures 3; references 8: 1 Russian, 7 Western.

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DEVELOPMENT OF PROTECTIVE TABLET COASTING TECHNOLOGY FOR VITAMINS B_1B_2C

18400005f Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 21, No 3, Mar 87 (manuscript received 19 Nov 85) pp 362-366

[Article by S.A. Minina, L.S. Yefimova, A.A. Nerkararyan, A.S. Bril and L.G. Seleznev, Leningrad Chemical-Pharmaceutical Institute]

[Abstract] The goal of this study was to select as optimal composition of polymer film coating and ways to deposit it on vitamin tablets. A number of candidates was evaluated experimentally leading to some preliminary findings which were then treated in a Box-Wilson mathematical model, yielding the following optimal parameters (in %): methylcellulose: 2; shellac: 1.35; polyethylene-glycol-400: 1; Tween-80: 1.0; dye: 0.03. A 4% aqueous solution of MC and a 2.7% shellac solution are mixed at a 1:1 volume ratio and plasticizers are added to this mixture. The mixture is stirred to reach homogeneity and deposited on the tablets. Vitamin tablets coated in this fashion retained their properties for up to 2 years. References: 7: (Russian).

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RESULTS AND PERSPECTIVES OF COMPREHENSIVE PROGRAM FOR DISEASE PREVENTION AND HEALTH PROMOTION

18400008a Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 6, Jun 87 pp 23-27

[Article by V.V. Kanep, V.V. Utkin, A.F. Blyuger, G.P. Sevastyanov, G.S. Popov, A.S. Gandz, N.A. Andreyev and I.P. Zuyev, Latvian SSR Ministry of Health, Riga]

[Abstract] In 1984, a comprehensive health promotion program was developed in the Latvian SSR, a republic that already enjoys the highest availability of patient beds in the world. The Latvian program was developed in accordance with the All-Union annual mass health screening program and designed to utilize, to the maximum, computerized data processing. The health examination component encompasses some 30 common disorders classed into 15 groups, and includes 120 diagnostic tests. In addition, a computer-assisted diagnostic program has been developed to facilitate differential diagnosis. The number of individuals encompassed by periodic mass screening in Latvia rose from 71% in 1984 to 85% in 1985. Concomitantly, the incidence of diagnosed State I breast cancer increased from 17.9 to 27.8%, and that of Stage I uterine cervical carcinoma from 26 to 39%. While overall tuberculosis morbidity diminished, that of pulmonary tuberculosis increased. The data also revealed a 30% reduction in mortality due to myocardial infarction and a 40% decrease in incapacity due to hypertension. In addition, to medical measures intended to facilitate diagnosis and treatment, social and educational measures are also being emphasized as valuable components in the comprehensive health program, designed to encompass at least 92% of the population.

12172/12223

UDC 616-006-084.3:008

AUTOMATED MONITORING OF AMBULATORY ONCOLOGIC PATIENTS

18400008b Moscow SOVESKOYE ZDRAVOOKHRANENIYE in Russian No 6, Jun 87 (manuscript received 25 Mar 86) pp 31-34

[Article by A.Ye. Okeanov, candidate of medical sciences, Scientific Research Institute of Oncology and Medical Radiology, Belorussian SSR Ministry of Health, Minsk]

[Abstract] Description is provided of the design and performance of an automated system, implemented in 1984, for monitoring ambulatory oncologic patients in Belorussia. The primary purpose was to facilitate early detection and provide better control over ambulatory patients, recognizing that the patient population increased by 57% over the previous 10 years. The computer-based system provides information on regular appointments, sends out reminder notices to the patients, monitors compliance and alerts medical authorities to any change in status or noncompliance. The data also provide a wealth of statistical information on the efficiency with which the existing oncologic services function and on cancer statistics. The available software for the mainframe computers is currently being complemented with programs written for personal computers to be used at the oncologic out-patient clinics.

12172/12223

UDC 364.444:[364.65-053.2+364.65-055.26

COMPOSITION OF OUT-OF-TOWN PARTURIENT WOMEN IN MOSCOW

18400009a Moscow SOVETSKOYE ZDRAVOKHRANENIYE in Russian No 7, Jul 87 (manuscript received 3 Dec 86) pp 24-26

[Article by Ye.L. Dubinskaya, All-Union Scientific Research Institute of Social Hygiene and Health Administration imeni N.A. Semashko, USSR Ministry of Health, Moscow]

[Abstract] An analysis was conducted on the factors that lead parturient women to exercise their right to seek medical assistance at locations other than their place of residence when it comes to deliveries. In particular, the study was designed to assess the reason that such women accounted for 10% of all deliveries in Moscow in 1985, an increase over 7.6% seen in 1978. The primary factor was psychological, based on a conviction that obstetrical services were superior in Moscow. A statistical breakdown revealed that 77% of the women in this category came from other areas in the Moscow Oblast, and that they accounted for 40-94% of the deliveries at some of the Moscow delivery clinics. The data also revealed that the frequency of prenatal care was two-fold lower among the women in this contingent than in Moscow natives.

12172/12223

UDC 614.2:618.1-084.3

MASS SCREENING --DISPENSARIZATION--OF GYNECOLOGIC PATIENTS IN LARGE CITIES

18400009b Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 7, Jul 87 (manuscript received 16 Jan 87) pp 31-34

[Article by V.I. Grishtayeva, All-Union Scientific Research Institute of Social Hygiene and Public Health Organization imeni N.A. Semashko, USSR Ministry of Health, Moscow]

[Abstract] A three-year analysis was conducted on mass screening and out-patient services in Moscow, based on analysis of results obtained in 1983-1985 from 20 women's clinics serving 240,000 women. The general gynecologic morbidity was 73.7/1000 women, with the morbidity patterns remaining unaltered in that time. Inflammatory conditions were encountered most frequently (22%), of which half were accounted for by colpitis. Benign tumors were next in frequency (16%), with myomas representing ca. 2/3rd of such cases. Finally, diseases of the cervix uteri accounted for 15.2% of the gynecologic pathology, and primarily consisted of erosions. In that time period, the number of women encompassed by the annual health examination program increased with each year. In addition, at many of the women's clinics, services were extended to include breast examination, proctoscopy, skin examination, and so forth. Such examinations, conducted on a regular basis, will facilitate definition of risk groups and therapy promote preventive health care.

12172/12223

UDC 577.391,577.7

EFFECTS OF LONG-TERM EXTERNAL GAMMA-IRRADIATION OF LONGEVITY AND MORTALITY PATTERNS IN RATS

18400006a Moscow RADIOBIOLOGIYA in Russian Vol 27, No 4, Jul-Aug 87 (manuscript received 18 Jun 86) pp 497-501

[Article by P.V. Goloshchapov, V.P. Boytsova and M.I. Vorobyeva, Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] Outbred rats were employed in an analysis of the effects of long-term gamma-irradiation on longevity and mortality patterns, commencing with 3 month-old rats (130-150 g) exposed to 0.19 to 13.6 cGy/day (20-22 h/day) gamma radiation from a cesium source. Analysis of the survival times for the different experimental and control groups revealed that for the latter group the mean survival time was 702 days. For groups exposed to 0.19 to 0.7 cGy/day, the reduction in longevity was not statistically significant, ranging between 697 and 673 days in relation to dosage. Irradiation at doses of 0.8 cGy/day and greater resulted in statistically significant reductions in longevity. Mathematically, survival times were described by the following relationship: average survival time = 683 x exp(-0.0528 x D), where D = dose. The four primary causes of death were radiation injuries (hemopoietic disorders), inflammation of respiratory organs, malignancies, and pathologic changes in other organs. Basically, there were no telling differences in the causes of mortality among the groups, and radiation-induced tumors were not a specific cause of death. Figures 2; references 8: 4 Russian, 4 Western.

12172/12223

UDC 577.391;577.7

ANALYSIS OF EFFECTS OF LONG-TERM EXTERNAL GAMMA-IRRADIATION OF RAT LONGEVITY IN SUPPORT OF AGING HYPOTHESIS

18400006b Moscow RADIOBIOLOGIYA in Russian Vol 27, No 4, Jul-Aug 87 (manuscript received 7 Jul 86) pp 501-504

[Article by P.V. Goloshchapov and M.I. Vorobyeva, Institute of Biophysics, USSR Ministry of Health, Moscow]

[Abstract] A quantitative analysis was conducted on mortality due to long-term gamma-irradiation of outbred male rats, beginning with the animal age of 3 months. Evaluation of shifts in Homperz plots of rats subjected to 0.19 to 13.5 cGy/day showed that the curves for the experimental rats were shifted above the control curve, indicating premature aging of the irradiated rats. Mortality was shown to be dependent on two factors of external gamma-irradiation: intensity and time. The decrease in the lifespan of the experimental rats was thus shown to be due to premature aging. Figures 2; references 9: 6 Russian, 3 Western.

12172/12223

UDC 577.391;591.111;547.963.3

EARLY CHANGES IN FRACTIONAL COMPOSITION OF SERUM NUCLEIC ACIDS IN RATS WITH RADIATION INJURIES DUE TO GAMMA-IRRADIATION

18400006c Moscow RADIOBIOLOGIYA in Russian Vol 27, No 4, Jul-Aug 87 (manuscript received 27 Nov 86) pp 505-510

[Article by A.S. Belokhvostov, S.N. Lebedev and S.S. Sherlina, Military Medical Academy imeni S.M. Kirov, Leningrad]

[Abstract] An analysis was conducted on the fractional composition of DNA and RNA in the sera of male rats (180-200 g) subjected to lethal (8Gy) and supralethal (100 Gy) gamma-irradiation, to assess the potential diagnostic usefulness of nucleic acids as indicators of radiation injury. The data showed that the most pronounced changes were seen after 100 Gy irradiation, with a maximum increase in serum DNA seen after 5 h (394 ng/ml vs. 57.3 ng/ml in control rats). The elevation in DNA persisted for at least the 3-day period of observation. Polyacrylamide gel electrophoretic analysis showed that the increase was due primarily to a heterogenous DNA fraction with MW of (1-15) x 10^6 daltons. In addition, a low-MW DNA fraction was also discovered in the experimental animals which was lacking in control rates. In terms of electrophoretic mobility the latter fraction corresponded to mononucleosomal DNA. On tentative grounds, elevation of DNA levels in the sera of the irradiated rats appears to be due to enhanced release of e rachromosomal DNA from cells. Figures 3; references 12: 5 Russian, 7 Western.

12172/12223

UDC 577.391;612.419

RADIOPROTECTIVE EFFICACY OF TIBIAL MEDULLARY CANAL LAVAGE IN GUINEA PIGS

18400006d Moscow RADIOBIOLOGIYA in Russian Vol 27, No 4, Jul-Aug 87 (manuscript received 8 Sep 86) pp 521-524

[Article by L.M. Rozhdestvenskiy and Ye.N. Shcherbova, Institute of Biophysics, USSR Ministry of Health, Moscow]

[Abstract] Studies were conducted with highly-radiosensitive guinea pigs to further define the parameters under which bone marrow depletion may enhance radioresistance. The present data demonstrated that lavage of the tibial medullary cavity with medium 199, 1-1.5 h before or 0.5-2 h after gamma-irradiation with 4-6 Gy (2 Gy/min), increased ca. 2-fold the 30 day survival figures for the experimental animals as opposed to control animals. However, tibial lavage was ineffective with supralethal irradiation (8 Gy). In addition, evaluation of seasonal factors demonstrated that the procedure was more effective in the summer. The effectiveness of this treatment as a radioprotective modality was attributed to enhancement of systemic regenerative mechanism, although the details remain to be elucidated. Figures 3; references 5: 3 Russian, 2 Western.

12172/12223

UDC 577.391:612.273:612.112.94

CORRELATION OF RADIOPROTECTIVE EFFECTS OF HYPOXIC GAS MIXTURES AND LYMPHOCYTIC SUCCINATE DEHYDROGENASE ACTIVITY

18400006e Moscow RADIOBIOLOGIYA in Russian Vol 27, No 4, Jul-Aug 87 (manuscript received 21 Apr 86) pp 524-528

[Article by A.N. Gaydamakin and M.M. Abramov]

[Abstract] Comparative studies were conducted on outbred rats and dogs in order to assess the indicator value of lymphocytic succinate dehydrogenase (SDH) activity in reflecting radioprotection afforded by hypoxic hypoxia. The gamma-irradiated rats (7-17 Gy whole body) and dogs (4 Gy) were subjected to gas mixtures containing 5-21% oxygen for correlation with survival rates and SDH activities. Each gas mixture was found to correspond to a definite increase in SDH activity, expressed in mathematical terms as $V_{SDH} = 4393.5 \times (\% O_2)^{-2.58}$ for rats and $V_{SDH} = 130.76 \times (\% O_2)^{-1.42}$ for dogs. Since the different gas mixtures were correlated with different survival rates, the increase in SDH may be used as another parameter for assessing radioprotective effectiveness of such gas mixtures. Figures 2; tables 1; references 6: (Russian)

12172/12223

UDC 577.391:615.771.8;599.323.4

RADIOPROTECTIVE EFFICACY AND MECHANISM OF ACTION OF AMINOARYLTHIAZOLES

18400006f Moscow RADIOBIOLOGIYA in Russian Vol 27, No 4, Jul-Aug 87 (manuscript received 20 Oct 86) pp 528-532

[Article by V.G. Vladimirov, O.N. Chupakhin, A.P. Novikova, L.G. Yegorova, N.I. Libikova, N.M. Perova, Ye.Ye. Strelnikova and L.A. Sharova, Military Medical Academy imeni M.S. Kirov, Leningrad; Ural Polytechnic Institute imeni S.M. Kirov, Sverdlovsk]

[Abstract] A series of 17 aminoarylthiazoles were synthesized and tested for their radioprotective efficacy in relation to 2-amino-4-phenylthiazole hydrobromide, known to yield 66% 30-day survival rates in mice subjected to 7.3 Gy gamma-irradiation. The preparations were injected intraperitoneally to mice 1 h before irradiation in optimally tolerable doses (100-400 mg/kg), with subsequent determinations of 30-day survival rates. Structure-activity analysis demonstrated that the amino group was primarily responsible for radioprotection, with secondary importance attributed to the phenyl moiety. Bone marrow studies on P-32 phosphate incorporation into bone marrow DNA showed that the effective agents inhibited DNA synthesis by up to 50%, 3 h after administration. DNA inhibition was considered as the mechanism responsible for radioprotection, since it predisposed to more complete post-radiation DNA rapair and favors survival of a larger numer of hemopoietic cells. Figures 2; references 10: 8 Russian, 2 Western.

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